



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

| | | | | |
|------------|------------|----------------------|------------------|------|
| 10/766,341 | 01/27/2004 | Manoj Ramprasad Shah | 136967 (1306-49) | 3284 |
|------------|------------|----------------------|------------------|------|

6147 7590 11/16/2005

GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

| |
|----------|
| EXAMINER |
|----------|

LE, DANG D

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2834

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/766,341

Applicant(s)

SHAH ET AL.

Examiner

Dang D. Le

Art Unit

2834

m

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 9/13/05 have been fully considered but they are not persuasive. The applicant argument is on the ground that "Shilling expressly teaches away from the use of an exciter stator salient pole structure (see, for example, Col. 4, line 47 - Col. 5, line 13, and more particularly, Col. 5, line 6-13)." The examiner disagrees because Shilling et al. clearly teaches to use alternating current (AC) salient poles with windings (42). Also see column 3, lines 40-47. It is noted that the poles in Figure 3 of Shilling et al. and Figures 2 and 3 of Hoffmann et al. are salient poles because they project from the yoke or the hub towards the primary winding core. What Shilling et al. means in columns 4 and 5 is to remove the "separate" DC exciter stator salient pole field structure not to remove the AC exciter field windings. See column 4, line 48.

As a result, the rejection is still deemed proper and repeated hereinafter.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following features must be shown or the feature(s) canceled from the claim(s). No new matter should be entered:

- The flared extension of AC poles in claims 16 and 20. The drawings show only the above claimed features for DC poles.

- The wedge in claims 17 and 21.
- The freestanding AC filed coil in claims 18 and 22. The Drawings only show the AC coils being supported by poles 172.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 18 and 22 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The features in

claims 18 and 22 are contradicted to what are claimed in claims 1 and 6, respectively. Claims 1 and 6 require that the AC coils are disposed on the salient poles. Claims 18 and 22 eliminate the salient poles. Without the salient poles, the claims could be read on Hoffmann et al. because Hoffmann et al. does not use salient poles for AC coils as shown in Figure 3.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-11, 13, 18, 19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffmann et al. (4,093,869) in view of Shilling et al. (4,743,777).

Regarding claim 1, Hoffman et al. shows a synchronous electric machine having a rotor member (25) and a stator member (50) having a stator core (Figures 2 and 3), the electric machine comprising:

- a main machine having a direct current (DC) rotor field winding (26) mounted on the rotor member, and
- a dual alternating current/direct current (AC/DC) excitation system for said synchronous machine comprising:
 - a rotatable polyphase armature winding (24) in electrical communication with a rectifier assembly (16) for conducting direct current to said rotor field winding;
 - a plurality of DC salient poles (52) and at least one alternating current (AC) air pole both included in the stator core, wherein respective AC air poles of the at least one AC air pole are disposed between adjacent DC salient poles of the plurality of DC salient poles;
 - at least one DC field winding (57), each DC field winding having at least one DC field coil disposed on at least one DC salient pole of the plurality of DC salient poles; and
 - at least one AC field winding (62), each AC field winding having at least one AC field coil disposed on at least one AC air pole of the at least one AC air pole, a magnetic axis of respective AC field coils being disposed substantially in electromagnetic space-quadrature relation with respect to magnetic axes of adjacent DC field coils, wherein when said respective AC field coils (62) are

energized, an alternating current is induced in said polyphase armature winding for providing excitation to said main machine.

Hoffman et al. does not show the use of alternating current (AC) salient poles. Hoffmann et al. use air cores between DC salient poles (52, Figure 3 and column 4, lines 46-48)

Shilling et al. uses alternating current (AC) salient poles (coil 42 around stator poles in Figure 3) for the purpose of increasing the starting torque of the starter.

It is noted that in the art of motor and generator, it is well known that the stator can be made with either air cores or iron cores. Iron cores can concentrate or guide magnetic flux and increase magnetic flux (magnetic field) but more expensive because of the cost of the iron cores. In contrast, air cores are cheaper but do not produce strong magnetic flux and cannot guide magnetic flux.

Since Hoffman et al. and Shilling et al. are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize iron cores instead of air cores as taught by Shilling et al. for the purpose discussed above.

Regarding claims 2 and 3, it is noted that Hoffman et al. and Shilling et al. also shows all of the limitations of the claimed invention.

Regarding claim 4, it is noted that Shilling et al. also shows all of the limitations of the claimed invention including the size being selectable in accordance with applications

requirements for starting and running the main machine (the size is chosen to be the same in Shilling et al.)

Regarding claim 5, it is noted that Shilling et al. also shows all of the limitations of the claimed invention in column 3, lines 40-50.

Regarding claims 6-8, 10, and 11, these claims are similar to claims 1-5, respectively. As a result, they are also rejected.

Regarding claim 9, it is noted that Shilling et al. also shows all of the limitations of the claimed invention in Figure 2. See winding 42.

Regarding claims 13 and 19, it is noted that Hoffmann et al. and Shilling et al. both show single phase windings could also be used.

Regarding claims 18 and 22, it is noted that Hoffmann et al. also shows free standing AC coil in Figure 3 and column 4, lines 47-50.

7. Claims 14-16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffmann et al. in view of Shilling et al. as respectively applied to claims 1 and 6 above, and further in view of Sibata (5,220,228).

Regarding claims 14-16 and 20, the machine of Hoffmann et al. modified by Shilling et al. includes all of the limitations of the claimed invention except for the flared extension.

Sibata provides the flared extension (14a, 14b) for the purpose of enhancing the sinusoidal waveform of the induced voltage.

Since Hoffmann et al., Shilling et al., and Sibata are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to include flared extension as taught by Sibata for the purpose discussed above.

8. Claims 17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffmann et al. in view of Shilling et al. as respectively applied to claims 1 and 6 above, and further in view of Kirschensteiner et al. (4,667,124).

Regarding claims 17 and 21, the machine of Hoffmann et al. modified by Shilling et al. includes all of the limitations of the claimed invention except for the non-metallic wedge.

Kirschensteiner et al. uses non-metallic wedges (30) for the purpose of retaining the winding in place.

Since Hoffmann et al., Shilling et al., and Kirschensteiner et al. are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use wedges as taught by Kirschensteiner et al. for the purpose discussed above.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Information on How to Contact USPTO

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dang D. Le whose telephone number is (571) 272-2027. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2834

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

11/11/05

A handwritten signature in black ink, appearing to read 'Dangle', is written over the printed name.

DANGLE
PRIMARY EXAMINER